

**Worksheet 1. Contact and Methyl Bromide Request Information**

The following information will be used to determine the amount of methyl bromide requested and the contact person for this request. It is important that we know whom to contact in case we need additional information during the review of the application.

**1. Location**

(Enter the state, region, or county. Provide more detail about the location if relevant to the feasibility of alternatives to methyl bromide.)

California

**2. Crop/commodity**

(Include all crops/commodities that benefit from the application of methyl bromide in a fumigation cycle. A fumigation cycle is the period of time between methyl bromide fumigations.)

Prune (dried plum), fig, raisin - Postharvest

**3. Climate**

(Individual users should enter their climate zone designation by reviewing the U.S. climate zone map. If a consortium is submitting this application, please indicate the estimated percentage of consortium users in each climate zone. This map is located at the end of this workbook or it can be reviewed online at <http://www.usna.usda.gov/Hardzone/ushzmap.html>).

Not applicable for this use pattern

**4. Soil type** Check the box(es) for the soil types and percent organic matter that apply to your area. If a consortium is submitting this application, please indicate the estimated percentage of consortium users in each soil type.

Soil Type:	Light <u>NA</u>	Medium _____	Heavy _____
Organic Matter:	0 to 2% <u>NA</u>	2 to 5 % _____	over 5% _____

**5. Other geographic factors that may affect crop/commodity yield (e.g., water table).**

Warehouse/container conditions

**6. Consortium name** California Dried Plum Board **Specialty (check one)**

**7. Contact name** Gary Obenauf agronomic x

**8. Address** 144 Peace River Drive economic \_\_\_\_\_

Fresno, CA 93711-6953

**9. Daytime phone** 559-447-2127

**10. FAX** 559-436-0692

**11. E-mail** [gobenauf@agresearch.nu](mailto:gobenauf@agresearch.nu)

**List an additional contact person if available.**

**Specialty (check one)**

**12. Contact name** Richard L. Peterson agronomic X

**13. Address** 3841 N. Freeway Blvd., Suite 120 economic \_\_\_\_\_

Sacramento, CA 95834

**14. Daytime phone** 916-565-6235

**15. FAX** 916-565-6237

**16. E-mail** [rpeterson@cdpb.org](mailto:rpeterson@cdpb.org)

# Worksheet 1. Contact and Methyl Bromide Request Information

For EPA Use Only  
ID#

17. How much active ingredient (ai) of methyl bromide are you requesting for 2005? 45,000 lbs.

If a consortium is submitting this application, the data for question 17 and 17a. should be the total for the consortium.

In the question below, area is defined as follows for each user: acres for growers, cubic feet for post harvest operations, and square feet for structural applications.

- 17a. How much area will this be applied to? Please list units. 30,000,000 cubic feet units

18. Are you requesting methyl bromide for additional years beyond 2005? Yes X No

- 18a. If yes, please list year and quantity active ingredient (ai) of methyl bromide requested in the table below and explain why you need authorization for multiple years.

All commercial alternatives are being used; other alternatives have not proven to be commercially  
viable. Phosphine, the only available and effective alternative, is developing insect resistance  
in some commodities and is corrosive to equipment in warehouse conditions.

If a consortium is submitting this application, the data below should be the total for the consortium.

In the table below, **area is defined** as follows for each user: acres for growers, cubic feet for post harvest operations, and square feet for structural applications.

Year	Quantity ai (lb.) of Methyl Bromide	Area to be Treated	Unit of Area Treated
2006	45,000	30,000	1000 cubic feet
2007	45,000	30,000	1000 cubic feet

19. Target Pest(s) or Pest Problem(s):

(Be as specific as possible about the species or classes of pests relevant to the feasibility of alternatives.)

Indianmeal Moth (*Plodia interpunctella*) - primary pest, Raisin moth (*Cadra figulilella*), Dried fruit beetle (*Carpophilus spp*),  
Vinegar flies (*Drosophila spp.*), Saw-tooth grain beetle (*Oryzophilus mercator*), Khapra beetle (*Trogoderma granarium*),  
Navel orange worm (*Amyelois transitella*). Other insects can be problem pests on dried fruit.

20. If applying as a consortium for many users of methyl bromide, please define a **representative user**. Define exactly, issues such as size of the operation (acres treated with methyl bromide for growers, cubic feet for post-harvest operations, and square feet for structural applications), whether the representative user owns or rents the land or operation, intensity of methyl bromide use (treat regularly or only when pest reaches a threshold), pest pressure, etc.

Owner operated facility having a capacity of approximately 500,000 cubic feet. Methyl bromide use is close to 100% at 1.5 lb./1000.  
cubic feet for fig and prunes, less for raisin. Raisins are stored longer than the other commodities, allowing for the use of  
alternatives requiring longer exposure times, such as phosphine.

- 20a. Explain why this user represents the typical user in the consortium.

This profile represents a cross section of major users (packers and dehydrators) representing 85% of the industry.

**Worksheet 2-A. Methyl Bromide - Use 1997-2000**

If a consortium is submitting this application, all data should reflect the <b>actual</b> data for the consortium.												
<b>Col A: Formulation of Methyl Bromide</b>	Enter the appropriate data in Col B-M for each formulation, if known, and/or the totals and averages for all formulations. If you enter only the total and averages for all formulations in the last row of the table, please describe in the comments section the formulations typically used, or the approximate proportions of the formulations used.											
<b>Col B, E, H, K: Actual Area Treated</b>	Enter the total actual area treated. Note: This number should be the <u>total actual</u> area treated by the individual user or total actual area for the entire consortium, for the year indicated.											
<b>Col C, F, I, L: Actual Total lbs. ai of Methyl Bromide Applied</b>	Enter the actual total pounds active ingredient (ai) of methyl bromide applied. Note: This number should be the total pounds ai applied by the individual user or the entire consortium, for the year indicated.											
<b>Col D, G, J, M: Actual Average lbs. ai Applied per Area</b>	The average application rates in pounds ai of methyl bromide per area are automatically calculated from the previous 2 columns.											
<b>Area is defined below</b> as follows for each user: acres for growers, cubic feet for post-harvest operations, and square feet for structural applications.												
A	B	C	D	E	F	G	H	I	J	K	L	M
<b>Formulation of Methyl Bromide</b>	<b>1997</b>			<b>1998</b>			<b>1999</b>			<b>2000</b>		
	<b>Total Actual Area Treated (1000 cu.ft.)</b>	<b>Actual Total lbs. ai of Methyl Bromide Applied</b>	<b>Average lbs. ai Applied per Area (1000 cu.ft.)</b>	<b>Total Actual Area Treated (1000 cu.ft.)</b>	<b>Actual Total lbs. ai of Methyl Bromide Applied</b>	<b>Average lbs. ai Applied per 1000 cu. ft.</b>	<b>Total Actual Area Treated (1000 cu.ft.)</b>	<b>Actual Total lbs. ai of Methyl Bromide Applied</b>	<b>Average lbs. ai Applied per 1000 cu.ft.</b>	<b>Total Actual Area Treated (1000 cu.ft.)</b>	<b>Actual Total lbs. ai of Methyl Bromide Applied</b>	<b>Average lbs. ai Applied per 1000 cu.ft.</b>
over 95% methyl bromide	17520.4	18740.55	1.06964167	57002.7	43787.85	0.76817151	39173.1	37481.19	0.95680939	24155.2	35828.08	1.48324502
75% methyl bromide, 25% chloropicrin												
67% methyl bromide, 33% chloropicrin												
50% methyl bromide, 50% chloropicrin												
___% methyl bromide, ___% chloropicrin												
___% methyl bromide, ___% chloropicrin												
All formulations of methyl bromide	17520.4	18740.55	1.06964167	57002.7	43787.85	0.76817151	39173.1	37481.19	0.95680939	24155.2	35828.08	1.48324502
<b>Comments:</b>												

**Worksheet 2-B. Methyl Bromide - Crop/Commodity Yield and Gross Revenue 1997-2000**

If a consortium is submitting this application, the data for this table should reflect the <b>actual averages</b> for the consortium.					
The purpose of this worksheet is to estimate the gross revenue for 1997 - 2000 when using methyl bromide. Post-harvest and structural users may work with EPA to modify this form to accommodate differences in operations when providing gross revenue data.					
<b>Col. A: Year</b>	Be sure to enter the year. Use as many rows as needed for each year for all the crops/commodities in the fumigation cycles from 1997 to 2000. If a fumigation cycle overlaps more than one calendar year, then the year of the fumigation cycle is the year methyl bromide was applied.				
<b>Col. B: Crop/Commodity</b>	Enter all crops/commodities that benefit from methyl bromide in each fumigation cycle. (For example, if normally methyl bromide is applied and tomatoes are grown and harvested followed by peppers without an additional treatment of methyl bromide, then both tomatoes and peppers would be part of the same fumigation cycle.) See the Fumigation Cycle Worksheet for a comprehensive definition of the fumigation cycle.  If someone other than the applicant benefits from the application of methyl bromide in the fumigation cycle and you do not have the quantitative data for the crops grown on the same land, please indicate so in the comments section below.				
<b>Col. C: Unit of Crop/Commodity</b>	Enter the unit of measurement for each crop/commodity.				
<b>Col. D: Crop/Commodity Yield</b>	Enter the number of units of crop/commodities produced per area.				
<b>Col. E: Price</b>	Enter the average prices received by the users for the year and crop/commodity indicated (1997-2000).				
<b>Col. F: Revenue</b>	This number is calculated automatically using the values you entered in Cols. D and E. You may override the formula to enter a different revenue. Please explain why the revenue amount is different in the comment section below.				
<b>Total Revenue for 1997-2000</b>	Enter the total revenue per year by adding the revenue for all crops for that year.				
<b>Average Revenue per Year:</b>	The average revenue per year is calculated automatically using the summary data you enter for each year.				
<b>Area is defined below</b> as follows for each user: acres for growers, cubic feet for post-harvest operations, and square feet for structural applications.					
A	B	C	D	E	F
<b>Year Methyl Bromide was Applied</b>	<b>Crop/Commodity</b>	<b>Unit of Crop/Commodity (e.g., pounds, bushels)</b>	<b>Crop/Commodity Yield (Units per acre.)</b>	<b>Price (per unit of crop/commodity)</b>	<b>Revenue (per acre.)</b>
1997	Prune	Tons	2.4	\$ 883.00	\$ 2,119.20
1998	Prune	Tons	1.2	\$ 764.00	\$ 916.80
1999	Prune	Tons	2	\$ 861.00	\$ 1,722.00
2000	Prune	Tons	2.4	\$ 809.00	\$ 1,941.60
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
				<b>Total Revenue for 1997</b>	\$ 2,119.20
				<b>Total Revenue for 1998</b>	\$ 916.80
				<b>Total Revenue for 1999</b>	\$ 1,722.00
				<b>Total Revenue for 2000</b>	\$ 1,941.60
				<b>Average Revenue Per Year</b>	\$ 1,674.90
<div style="display: flex; justify-content: space-between;"> <div>Comments:</div> <div>Source: CASS</div> </div>					

**Worksheet 2-B. Methyl Bromide - Crop/Commodity Yield and Gross Revenue 1997-2000**

If a consortium is submitting this application, the data for this table should reflect the <b>actual averages</b> for the consortium.					
The purpose of this worksheet is to estimate the gross revenue for 1997 - 2000 when using methyl bromide. Post-harvest and structural users may work with EPA to modify this form to accommodate differences in operations when providing gross revenue data.					
<b>Col. A: Year</b>	Be sure to enter the year. Use as many rows as needed for each year for all the crops/commodities in the fumigation cycles from 1997 to 2000. If a fumigation cycle overlaps more than one calendar year, then the year of the fumigation cycle is the year me				
<b>Col. B: Crop/Commodity</b>	Enter all crops/commodities that benefit from methyl bromide in each fumigation cycle. (For example, if normally methyl bromide is applied and tomatoes are grown and harvested followed by peppers without an additional treatment of methyl bromide, then bo  If someone other than the applicant benefits from the application of methyl bromide in the fumigation cycle and you do not have the quantitative data for the crops grown on the same land, please indicate so in the comments section below.				
<b>Col. C: Unit of Crop/Commodity</b>	Enter the unit of measurement for each crop/commodity.				
<b>Col. D: Crop/Commodity Yield</b>	Enter the number of units of crop/commodities produced per area.				
<b>Col. E: Price</b>	Enter the average prices received by the users for the year and crop/commodity indicated (1997-2000).				
<b>Col. F: Revenue</b>	This number is calculated automatically using the values you entered in Cols. D and E. You may override the formula to enter a different revenue. Please explain why the revenue amount is different in the comment section below.				
<b>Total Revenue for 1997-2000</b>	Enter the total revenue per year by adding the revenue for all crops for that year.				
<b>Average Revenue per Year:</b>	The average revenue per year is calculated automatically using the summary data you enter for each year.				
<b>Area is defined below</b> as follows for each user: acres for growers, cubic feet for post-harvest operations, and square feet for structural applications.					
A	B	C	D	E	F
<b>Year Methyl Bromide was Applied</b>	<b>Crop/Commodity</b>	<b>Unit of Crop/Commodity (e.g., pounds, bushels)</b>	<b>Crop/Commodity Yield (Units per acre.)</b>	<b>Price (per unit of crop/commodity)</b>	<b>Revenue (per acre.)</b>
1997	Fig	Tons	1.08	\$ 694.00	\$ 749.52
1998	Fig	Tons	0.98	\$ 594.00	\$ 582.12
1999	Fig	Tons	0.99	\$ 681.00	\$ 674.19
2000	Fig	Tons	1.08	\$ 672.00	\$ 725.76
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
				<b>Total Revenue for 1997</b>	\$ 749.52
				<b>Total Revenue for 1998</b>	\$ 582.12
				<b>Total Revenue for 1999</b>	\$ 674.19
				<b>Total Revenue for 2000</b>	\$ 725.76
				<b>Average Revenue Per Year</b>	\$ 682.90
<div style="display: flex; justify-content: space-between;"> <div>Comments:</div> <div>Source: CASS, NASS</div> </div>					

**Worksheet 2-B. Methyl Bromide - Crop/Commodity Yield and Gross Revenue 1997-2000**

If a consortium is submitting this application, the data for this table should reflect the <b>actual averages</b> for the consortium.					
The purpose of this worksheet is to estimate the gross revenue for 1997 - 2000 when using methyl bromide. Post-harvest and structural users may work with EPA to modify this form to accommodate differences in operations when providing gross revenue data.					
<b>Col. A: Year</b>	Be sure to enter the year. Use as many rows as needed for each year for all the crops/commodities in the fumigation cycles from 1997 to 2000. If a fumigation cycle overlaps more than one calendar year, then the year of the fumigation cycle is the year me				
<b>Col. B: Crop/Commodity</b>	Enter all crops/commodities that benefit from methyl bromide in each fumigation cycle. (For example, if normally methyl bromide is applied and tomatoes are grown and harvested followed by peppers without an additional treatment of methyl bromide, then bo  If someone other than the applicant benefits from the application of methyl bromide in the fumigation cycle and you do not have the quantitative data for the crops grown on the same land, please indicate so in the comments section below.				
<b>Col. C: Unit of Crop/Commodity</b>	Enter the unit of measurement for each crop/commodity.				
<b>Col. D: Crop/Commodity Yield</b>	Enter the number of units of crop/commodities produced per area.				
<b>Col. E: Price</b>	Enter the average prices received by the users for the year and crop/commodity indicated (1997-2000).				
<b>Col. F: Revenue</b>	This number is calculated automatically using the values you entered in Cols. D and E. You may override the formula to enter a different revenue. Please explain why the revenue amount is different in the comment section below.				
<b>Total Revenue for 1997-2000</b>	Enter the total revenue per year by adding the revenue for all crops for that year.				
<b>Average Revenue per Year:</b>	The average revenue per year is calculated automatically using the summary data you enter for each year.				
<b>Area is defined below</b> as follows for each user: acres for growers, cubic feet for post-harvest operations, and square feet for structural applications.					
A	B	C	D	E	F
<b>Year Methyl Bromide was Applied</b>	<b>Crop/Commodity</b>	<b>Unit of Crop/Commodity (e.g., pounds, bushels)</b>	<b>Crop/Commodity Yield (Units per acre.)</b>	<b>Price (per unit of crop/commodity)</b>	<b>Revenue (per acre.)</b>
1997	Raisin	Tons	1.16	\$ 262.00	\$ 303.92
1998	Raisin	Tons	1.6	\$ 290.00	\$ 464.00
1999	Raisin	Tons	1.03	\$ 321.00	\$ 330.63
2000	Raisin	Tons	1.28	\$ 157.00	\$ 200.96
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
<b>Comments:</b> <b>Source: CASS, NASS</b>				<b>Total Revenue for 1997</b>	\$ 303.92
				<b>Total Revenue for 1998</b>	\$ 464.00
				<b>Total Revenue for 1999</b>	\$ 330.63
				<b>Total Revenue for 2000</b>	\$ 200.96
				<b>Average Revenue Per Year</b>	\$ 324.88



**Worksheet 2-C. Methyl Bromide - Crop/Commodity Yield and Gross Revenue 2001**

If a consortium is submitting this application, the data for this table should reflect the **representative user** for the consortium.

The purpose of this worksheet is to estimate the gross revenue for 2001 when using methyl bromide. Post-harvest users may modify this form to accommodate differences when providing gross revenue data. If 2001 was not a typical year for the individual or firm, please indicate so in the comments section below.

<b>Col. A: Crop/Commodity</b>	Enter all crops/commodities that benefit from methyl bromide in the fumigation cycle (interval between fumigations) beginning with the treatment of methyl bromide in 2001. If multiple crops are grown during the interval between fumigations (e.g. tomatoes)  If someone other than the applicant benefits from the application of methyl bromide in the fumigation cycle and you do not have the quantitative data for the crops grown on the same land, please indicate so in the comments section below.
<b>Col. B: Price Factors</b>	Enter factors that determine prices (e.g., grade, time, market). If you received different prices for your crop/commodity as a result of quality, grade, market (e.g. fresh or processing), timing of harvest, etc., you may itemize by using more than one row.
<b>Col. C: Unit of Crop/Commodity</b>	Enter the unit of measurement for each crop/commodity.
<b>Col. D: Crop/Commodity Yield</b>	Enter the number of units of crop/commodity produced per area for that price factor.
<b>Col. E: Price</b>	Enter average 2001 prices received by the users for that crop/commodity and price factor.
<b>Col. F: Revenue</b>	Revenue is automatically calculated using the data you entered for yield and price. If revenue is not equal to yield times price, you may override the formula and enter a different revenue amount. Please explain why this revenue amount is different in the comments section below.

**Area is defined below** as follows for each user: acres for growers, cubic feet for post-harvest operations, and square feet for structural applications.

A	B	C	D	E	F
Crop/Commodity	Price Factors (grade, time, market)	Unit of Crop/Commodity (e.g., pounds, bushels)	Crop/Commodity Yield (Units per acre)	Price (per unit of crop/commodity)	Revenue (per acre)
Fig	market	Tons	0.89	\$ 932.00	\$ 829.48
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
				<b>Total Revenue</b>	<b>\$ 829.48</b>

Comments: Source - CASS



**Worksheet 2-C. Methyl Bromide - Crop/Commodity Yield and Gross Revenue 2001**

If a consortium is submitting this application, the data for this table should reflect the **representative user** for the consortium.

The purpose of this worksheet is to estimate the gross revenue for 2001 when using methyl bromide. Post-harvest users may modify this form to accommodate differences when providing gross revenue data. If 2001 was not a typical year for the individual or firm,

<b>Col. A: Crop/Commodity</b>	Enter all crops/commodities that benefit from methyl bromide in the fumigation cycle (interval between fumigations) beginning with the treatment of methyl bromide in 2001. If multiple crops are grown during the interval between fumigations (e.g. tomatoes)  If someone other than the applicant benefits from the application of methyl bromide in the fumigation cycle and you do not have the quantitative data for the crops grown on the same land, please indicate so in the comments section below.
<b>Col. B: Price Factors</b>	Enter factors that determine prices (e.g., grade, time, market). If you received different prices for your crop/commodity as a result of quality, grade, market (e.g. fresh or processing), timing of harvest, etc., you may itemize by using more than one row.
<b>Col. C: Unit of Crop/Commodity</b>	Enter the unit of measurement for each crop/commodity.
<b>Col. D: Crop/Commodity Yield</b>	Enter the number of units of crop/commodity produced per area for that price factor.
<b>Col. E: Price</b>	Enter average 2001 prices received by the users for that crop/commodity and price factor.
<b>Col. F: Revenue</b>	Revenue is automatically calculated using the data you entered for yield and price. If revenue is not equal to yield times price, you may override the formula and enter a different revenue amount. Please explain why this revenue amount is different in the comments section.

**Area is defined below** as follows for each user: acres for growers, cubic feet for post-harvest operations, and square feet for structural applications.

A	B	C	D	E	F
Crop/Commodity	Price Factors (grade, time, market)	Unit of Crop/Commodity (e.g., pounds, bushels)	Crop/Commodity Yield (Units per acre)	Price (per unit of crop/commodity)	Revenue (per acre)
Raisin	market	Tons	1.82	\$ 179.00	\$ 325.78
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
				<b>Total Revenue</b>	<b>\$ 325.78</b>

Comments: Source - CASS

**Worksheet 2-D. Methyl Bromide - Use and Costs for 2001**

If a consortium is submitting this application, the data in Cols. B, C, D, and E should reflect the *representative user* in the consortium. The data in Col. F should reflect the **actual** area treated by all users in the consortium.

If the methyl bromide is custom applied then put the cost per area in Column G and fill in the average lb ai of methyl bromide applied per area (Col B) and the Total Actual Area Treated (Col F).

If 2001 was not a typical year for the individual or for the representative user of a consortium, the applicant may provide additional data for a different year. However, all applicants must complete this worksheet for the year 2001 regardless. If you provide an additional year's data, please explain in the comment section at the bottom of the worksheet why 2001 is not considered a typical year.

<b>Col. A: Formulation of Methyl Bromide</b>	Enter the appropriate data in Col B-G for each formulation, if known, and/or the totals and averages for all formulations of methyl bromide. If you just enter data in the bottom row in the table (All formulations of methyl bromide), please describe in the comments, the relative usage of the various formulations, to the extent known.
<b>Col B: Average lbs. active ingredient (ai) of Methyl Bromide Applied per Area</b>	Enter the average pounds active ingredient (ai) of methyl bromide applied per area.
<b>Cols. C, D, E, G: Prices and Costs</b>	Enter the average price per pound active ingredient (ai) of methyl bromide in Col. C and the average cost of applying methyl bromide per area treated in Col. D. In Col. E, enter the average other costs per area associated with applying methyl bromide (e.g., tarps). Column G will be calculated automatically using the values you entered in columns B-E. If methyl bromide is custom applied, enter the cost per area in Col. G and fill in Cols. B and F.
<b>Col. F: Actual Area Treated</b>	Enter the <b>actual</b> area treated. Note: This number should be the total area treated by all users in the consortium.

**Area is defined below** as follows for each user: acres for growers, cubic feet for post-harvest operations, and square feet for structural applications.

A	B	C	D	E	F	G
Formulation of Methyl Bromide	Lb. ai of Methyl Bromide Applied per 1000 cubic ft. (2001 Average)	Price per lb. ai of Methyl Bromide (2001 Average)	Cost of Applying Pesticide per 1000 cu. Ft. (2001 Average)	Other MBr Costs (e.g. tarps, etc.) per Area (2001 Average)	Total Actual Area Treated in the Consortium	Cost per 1000 cubic feet
over 95% methyl bromide	1.5	\$ 4.00	\$ 5.14		100%	\$ 11.14
75% methyl bromide, 25% chloropicrin						\$ 0.00
67% methyl bromide, 33% chloropicrin						\$ 0.00
50% methyl bromide, 50% chloropicrin						\$ 0.00
__% methyl bromide, __% chloropicrin						\$ 0.00
__% methyl bromide, __% chloropicrin						\$ 0.00
						\$ 0.00
All formulations of methyl bromide						\$ 11.14

**Comments:** Prune and Fig Only. From personal interviews representing 75% of commodity volume.

**Worksheet 2-D. Methyl Bromide - Use and Costs for 2001**

If a consortium is submitting this application, the data in Cols. B, C, D, and E should reflect the *representative user* in the consortium. The data in Col. F should reflect the **actual** area treated by all users in the consortium.

If the methyl bromide is custom applied then put the cost per area in Column G and fill in the average lb ai of methyl bromide applied per area (Col B) and the Total Actual Area Treated (Col F).

If 2001 was not a typical year for the individual or for the representative user of a consortium, the applicant may provide additional data for a different year. However, all applicants must complete this worksheet for the year 2001 regardless. If you pr

<b>Col. A: Formulation of Methyl Bromide</b>	Enter the appropriate data in Col B-G for each formulation, if known, and/or the totals and averages for all formulations of methyl bromide. If you just enter data in the bottom row in the table (All formulations of methyl bromide), please describe in th
<b>Col B: Average lbs. active ingredient (ai) of Methyl Bromide Applied per Area</b>	Enter the average pounds active ingredient (ai) of methyl bromide applied per area.
<b>Cols. C, D, E, G: Prices and Costs</b>	Enter the average price per pound active ingredient (ai) of methyl bromide in Col. C and the average cost of applying methyl bromide per area treated in Col. D. In Col. E, enter the average other costs per area associated with applying methyl bromide (e.g
<b>Col. F: Actual Area Treated</b>	Enter the <b>actual</b> area treated. Note: This number should be the total area treated by all users in the consortium.

**Area is defined below** as follows for each user: acres for growers, cubic feet for post-harvest operations, and square feet for structural applications.

A	B	C	D	E	F	G
Formulation of Methyl Bromide	Lb. ai of Methyl Bromide Applied per 1000 cubic ft. (2001 Average)	Price per lb. ai of Methyl Bromide (2001 Average)	Cost of Applying Pesticide per 1000 cu. Ft. (2001 Average)	Other MBr Costs (e.g. tarps, etc.) per Area (2001 Average)	Total Actual Area Treated in the Consortium	Cost per 1000 cubic feet
over 95% methyl bromide	1.5	\$ 4.00	\$ 0.50		20%	\$ 6.50
75% methyl bromide, 25% chloropicrin						\$ 0.00
67% methyl bromide, 33% chloropicrin						\$ 0.00
50% methyl bromide, 50% chloropicrin						\$ 0.00
__% methyl bromide, __% chloropicrin						\$ 0.00
__% methyl bromide, __% chloropicrin						\$ 0.00
						\$ 0.00
All formulations of methyl bromide						\$ 6.50

**Comments: Raisin Only. From personal interviews.**

**Worksheet 2-E. Methyl Bromide - Other Operating Costs for 2001**

<b>Do not include methyl bromide costs.</b>					
If a consortium is submitting this application, the data for this table should reflect a <b>representative user</b> .					
Enter all operating costs except methyl bromide costs incurred during the fumigation cycle (interval between fumigations) beginning in 2001. See the Fumigation Cycle Worksheet for a comprehensive definition of the fumigation cycle. Enter these costs in Col B for custom operations, <b>or</b> in Col C and D for operations done by user.					
Submit crop budgets for each crop, if available. You may submit crop budgets electronically or in hard copy. If your costs are significantly different than the crop budgets, please explain in the comments.					
<b>Col A: Operation</b>	Identify in Col A the operations (except methyl bromide) to which the costs apply. For growers, these operations should include but are not limited to (1) prepare soil, (2) fertilize, (3) irrigate, (4) plant, (5) harvest, (6) other pest controls, etc. You must include all other operating costs.				
<b>Col B: Custom Operation Cost</b>	If you incur custom operation costs, enter those costs in Col. B.				
<b>Col C: Material Cost per Area</b>	If you do not incur custom operation costs, enter the material cost per area.				
<b>Col D: Labor Cost per Area</b>	If you do not incur custom operation costs, enter the labor cost per area.				
<b>Col E: Total Cost per Area</b>	The total cost per area is calculated automatically from the values you enter in Cols. C and D.				
<b>Col F: Typical Equipment Used</b>	Identify the typical equipment used for operations done by user. Please be specific, such as tractor horsepower. No cost data is required in this column.				
<b>Area is defined below</b> as follows for each user: acres for growers, cubic feet for post-harvest operations, and square feet for structural applications.					
A	B	C	D	E	F
Operation	Custom Operation Cost per Area	Operation Done by User			
		Material Cost per 1000 cu.ft.	Labor Cost per 1000 cu.ft.	Total Cost per 1000 cu.ft.	Typical Equipment Used
SEE COMMENT				\$ 0.00	
				\$ 0.00	
				\$ 0.00	
				\$ 0.00	
				\$ 0.00	
				\$ 0.00	
				\$ 0.00	
				\$ 0.00	
				\$ 0.00	
				\$ 0.00	
				\$ 0.00	
				\$ 0.00	
				\$ 0.00	
<b>Total Custom per Area</b>	\$ 0.00		<b>User Total per 1000 cu.ft.</b>	\$ 0.00	
COSTS NOT AVAILABLE FOR DEHYDRATING OR PACKING OPERATIONS.					

**Worksheet 2-F. Methyl Bromide Fixed and Overhead Costs in 2001**

If a consortium is submitting this application, the data for this table should reflect a **representative user**.

Enter **all** fixed and overhead costs incurred during the fumigation cycle (interval between fumigations) beginning in 2001. See the Fumigation Cycle Worksheet for a comprehensive definition of the fumigation cycle.

<b>Col A: Cost Item</b>	Identify in Col. A the cost items. These items should include, but are not limited to: (1) land rent, (2) interest, (3) depreciation, (4) management, and (5) overhead such as office and administration.)
<b>Col B: Description</b>	Please describe the cost in more detail.
<b>Col C: Allocation Method</b>	Please describe how you estimated the portion of total fixed cost of the farm or entity that applies to this crop/commodity.
<b>Col D: Cost per Area</b>	Enter the cost per area of methyl bromide treated.

**Area is defined below** as follows for each user: acres for growers, cubic feet for post-harvest operations, and square feet for structural applications.

A	B	C	D
Cost Item	Description	Allocation Method	Cost per 1000 cu. ft.
SEE COMMENTS			
<b>Total</b>			<b>\$0.00</b>

Comments: COSTS NOT AVAILABLE FOR DEHYDRATING AND PACKING OPERATIONS.

## Worksheet 3-A. Alternatives - Technical Feasibility of Alternatives to Methyl Bromide

In this worksheet, you should address why an alternative pest management strategy on the list (see previous page) is or is not effective for your conditions. This worksheet contains 9 questions. You must complete one copy of worksheet 3-A for each research study you use to evaluate a single methyl bromide alternative. Use additional pages as need.

For worksheet 3-A you must complete one worksheet for each alternative, for each research study addressed. Please number the worksheets as follows. For the same alternative, first research study, label the worksheet 3-A(1)(a). For the same alternative, second research study, label the worksheet 3-A(1)(b). For the first alternative, third research study, label the worksheet 3-A(1)(c). For the second alternative, first research study, label the worksheet 3-(A)(2)(a). For the second alternative, second research study, label the worksheet 3-(A)(2)(b).

When completing Section II, if you cite a study that is on the EPA website, you only need to complete questions 1, 5, and 8.

Summarize each of the research studies you cite in the Research Summary Worksheet.

If you prefer, you may provide the information requested in this worksheet in a narrative review of one or more relevant research reports. The narrative review must reply to Section I and questions 1 through 8 in Section II. A Research Summary Worksheet of relevant treatments should be provided for each study reviewed.

### BACKGROUND

EPA must consider whether alternative pest control measures (pesticide and non-pesticidal, and their combination) could be used successfully instead of methyl bromide by crop and circumstance (geographic area.) The Agency has developed a list of possible alternative pest control regimens for various crops, which can be found at <http://www.epa.gov/ozone/mbr> or by calling 1-800-296-1996.

There are three major ways you can provide the Agency with proof of your investigative work.

- (1) Conduct and submit your own research
- (2) Cite research that has been conducted by others
- (3) Cite research listed on the EPA website

Whether you conduct the research yourself or cite studies developed by others, it is important that the studies be conducted in a scientifically sound manner. The studies should include a description of the experimental methodology used, such as application rates, application intervals, pest pressure, weather conditions, varieties of the crop used, etc. All results should be included, regardless of outcome. **You must submit copies of each study to EPA** unless they are listed on the Agency website.

The Agency has posted many research studies on a variety of crops on its website and knows of more studies currently in progress. EPA will add studies to its website as they become publicly available. You are encouraged to review the EPA website and other websites for studies that pertain to your crop and geographic area.

In addition, EPA acknowledges that, for certain circumstances, some alternatives are not technically feasible and therefore no research has been conducted (i.e. solarization may not be feasible in Seattle). You should look at the list of alternatives provided by the Agency and explain why they cannot be used for your crop and in your geographic area.

Use additional pages as needed.

Alternative: Phosphine

Study: Alternatives to Methyl Bromide on Dried Fruits and Nuts

## Section I. Initial Screening on Technical Feasibility of Alternatives

### 1. Are there any location-specific restrictions that inhibit the use of this alternative on your site?

- 1a. Full use permitted X
- 1b. Township caps
- 1c. Alternative not acceptable in consuming country
- 1d. Other (Please describe)

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If use of this alternative is precluded by regulatory restriction for all users covered by this application, the applicant should not complete Section II.

## Worksheet 3-A. Alternatives - Technical Feasibility of Alternatives to Methyl Bromide

### Section II. Existing Research Studies on Alternatives to Methyl Bromide

1. Is the study on EPA's website? Yes \_\_\_\_\_ No X

1a. If not on the EPA website, please attach a copy.

2. Author(s) or researcher(s) J. Larry Zettler, Research Entomologist; USDA, ARS  
San Joaquin Valley Agricultural Services Center  
Parlier, CA

3. Publication and Date of Publication Alternatives to Postharvest Uses of Methyl Bromide on Dried Fruits and Nuts to be Addressed by the CUE for Methyl Bromide

4. Location of research study Summary and bibliography of relevant research studies

5. Name of alternative(s) in study. If more than one alternative, list the ones you wish to discuss.

Phosphine  
\_\_\_\_\_  
\_\_\_\_\_

6. Was crop yield measured in the study? Yes NA No \_\_\_\_\_

7. Describe the effectiveness of the alternative in controlling pests in the study.

Widely used for deinfesting commodity.  
Requires longer exposure times than MeBr.  
Not as effective at lower temperatures as MeBr.  
\_\_\_\_\_

8. Discuss how the results of the study apply to your situation. Would you expect similar results? Are there other factors that would affect your adoption of this tool?

Corrosive to metal, resulting in higher equipment maintenance costs and would require construction of additional  
chambers (current warehouses have too much equipment that would corrode); problem for fig and prune.  
Evidence of insect resistance (documented in other commodities) which will accelerate with greater use.  
Longer exposure times to Phosphine reduces flexibility of handling fruit, especially for fig and prune.

## Worksheet 3-A. Alternatives - Technical Feasibility of Alternatives to Methyl Bromide

In this worksheet, you should address why an alternative pest management strategy on the list (see previous page) is or is not effective for your conditions. This worksheet contains 9 questions. You must complete one copy of worksheet 3-A for each resear

For worksheet 3-A you must complete one worksheet for each alternative, for each research study addressed. Please number the worksheets as follows. For the same alternative, first research study, label the worksheet 3-A(1)(a). For the same alternative,

When completing Section II, if you cite a study that is on the EPA website, you only need to complete questions 1, 5, and 8.

Summarize each of the research studies you cite in the Research Summary Worksheet.

If you prefer, you may provide the information requested in this worksheet in a narrative review of one or more relevant research reports. The narrative review must reply to Section I and questions 1 through 8 in Section II. A Research Summary Worksheet

### BACKGROUND

EPA must consider whether alternative pest control measures (pesticide and non-pesticidal, and their combination) could be used successfully instead of methyl bromide by crop and circumstance (geographic area.) The Agency has developed a list of possible

There are three major ways you can provide the Agency with proof of your investigative work.

- (1) Conduct and submit your own research
- (2) Cite research that has been conducted by others
- (3) Cite research listed on the EPA website

Whether you conduct the research yourself or cite studies developed by others, it is important that the studies be conducted in a scientifically sound manner. The studies should include a description of the experimental methodology used, such as applicati

The Agency has posted many research studies on a variety of crops on its website and knows of more studies currently in progress. EPA will add studies to its website as they become publicly available. You are encouraged to review the EPA website and othe

In addition, EPA acknowledges that, for certain circumstances, some alternatives are not technically feasible and therefore no research has been conducted (i.e. solarization may not be feasible in Seattle). You should look at the list of alternatives pro

Use additional pages as needed.

Alternative: CO<sub>2</sub> (high pressure)

Study: Alternatives to Methyl Bromide on Dried Fruits and Nuts

## Section I. Initial Screening on Technical Feasibility of Alternatives

### 1. Are there any location-specific restrictions that inhibit the use of this alternative on your site?

- 1a. Full use permitted X
- 1b. Township caps
- 1c. Alternative not acceptable in consuming country
- 1d. Other (Please describe)

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If use of this alternative is precluded by regulatory restriction for all users covered by this application, the applicant should not complete Section II.



## Worksheet 3-A. Alternatives - Technical Feasibility of Alternatives to Methyl Bromide

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### Section II. Existing Research Studies on Alternatives to Methyl Bromide

1. Is the study on EPA's website? Yes \_\_\_\_\_ No X

1a. If not on the EPA website, please attach a copy.

2. Author(s) or researcher(s) J. Larry Zettler, Research Entomologist; USDA, ARS  
San Joaquin Valley Agricultural Services Center  
Parlier, CA

3. Publication and Date of Publication Alternatives to Postharvest Uses of Methyl Bromide on Dried Fruits and Nuts to be Addressed by the CUE for Methyl Bromide

4. Location of research study Summary and bibliography of relevant research studies

5. Name of alternative(s) in study. If more than one alternative, list the ones you wish to discuss.

CO<sub>2</sub> (high pressure)  
\_\_\_\_\_  
\_\_\_\_\_

6. Was crop yield measured in the study? Yes NA No \_\_\_\_\_

7. Describe the effectiveness of the alternative in controlling pests in the study.

Can be lethal to insects in as little as 10 - 20 minutes.  
Requires fumigation chambers that can withstand required pressure.  
More suitable to dry commodities like spices.  
Can treat only low volume of commodity because chamber size must small to hold pressure.

8. Discuss how the results of the study apply to your situation. Would you expect similar results? Are there other factors that would affect your adoption of this tool?

This is not a commercially viable alternative. Construction costs for new and more chambers are required to  
implement this technology and handle commercial volumes of commodity. It limits high throughput of the  
commodity and is not practical for commercial operations.  
\_\_\_\_\_

## Worksheet 3-A. Alternatives - Technical Feasibility of Alternatives to Methyl Bromide

In this worksheet, you should address why an alternative pest management strategy on the list (see previous page) is or is not effective for your conditions. This worksheet contains 9 questions. You must complete one copy of worksheet 3-A for each resear

For worksheet 3-A you must complete one worksheet for each alternative, for each research study addressed. Please number the worksheets as follows. For the same alternative, first research study, label the worksheet 3-A(1)(a). For the same alternative,

When completing Section II, if you cite a study that is on the EPA website, you only need to complete questions 1, 5, and 8.

Summarize each of the research studies you cite in the Research Summary Worksheet.

If you prefer, you may provide the information requested in this worksheet in a narrative review of one or more relevant research reports. The narrative review must reply to Section I and questions 1 through 8 in Section II. A Research Summary Worksheet

### BACKGROUND

EPA must consider whether alternative pest control measures (pesticide and non-pesticidal, and their combination) could be used successfully instead of methyl bromide by crop and circumstance (geographic area.) The Agency has developed a list of possible

There are three major ways you can provide the Agency with proof of your investigative work.

- (1) Conduct and submit your own research
- (2) Cite research that has been conducted by others
- (3) Cite research listed on the EPA website

Whether you conduct the research yourself or cite studies developed by others, it is important that the studies be conducted in a scientifically sound manner. The studies should include a description of the experimental methodology used, such as applicati

The Agency has posted many research studies on a variety of crops on its website and knows of more studies currently in progress. EPA will add studies to its website as they become publicly available. You are encouraged to review the EPA website and othe

In addition, EPA acknowledges that, for certain circumstances, some alternatives are not technically feasible and therefore no research has been conducted (i.e. solarization may not be feasible in Seattle). You should look at the list of alternatives pro

Use additional pages as needed.

Alternative: Contact Insecticides

Study: Industry Knowledge

## Section I. Initial Screening on Technical Feasibility of Alternatives

### 1. Are there any location-specific restrictions that inhibit the use of this alternative on your site?

- 1a. Full use permitted \_\_\_\_\_
- 1b. Township caps \_\_\_\_\_
- 1c. Alternative not acceptable in consuming country \_\_\_\_\_
- 1d. Other (Please describe) \_\_\_\_\_

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If use of this alternative is precluded by regulatory restriction for all users covered by this application, the applicant should not complete Section II.

## Worksheet 3-A. Alternatives - Technical Feasibility of Alternatives to Methyl Bromide

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### Section II. Existing Research Studies on Alternatives to Methyl Bromide

1. Is the study on EPA's website? Yes \_\_\_\_\_ No   X  

1a. If not on the EPA website, please attach a copy.

2. Author(s) or researcher(s) Industry knowledge and experience.  
\_\_\_\_\_  
\_\_\_\_\_

3. Publication and Date of Publication NA

4. Location of research study \_\_\_\_\_

5. Name of alternative(s) in study. If more than one alternative, list the ones you wish to discuss.

Contact insecticides  
\_\_\_\_\_  
\_\_\_\_\_

6. Was crop yield measured in the study? Yes   NA   No \_\_\_\_\_

7. Describe the effectiveness of the alternative in controlling pests in the study.

See below.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

8. Discuss how the results of the study apply to your situation. Would you expect similar results? Are there other factors that would affect your adoption of this tool?

The industry has stopped using contact insecticides because of chemical residues and impracticality of treatment  
(to treat, fruit must be layed out in a single layer, sprayed, then returned to bulk storage).  
\_\_\_\_\_  
\_\_\_\_\_

## Worksheet 3-A. Alternatives - Technical Feasibility of Alternatives to Methyl Bromide

In this worksheet, you should address why an alternative pest management strategy on the list (see previous page) is or is not effective for your conditions. This worksheet contains 9 questions. You must complete one copy of worksheet 3-A for each resear

For worksheet 3-A you must complete one worksheet for each alternative, for each research study addressed. Please number the worksheets as follows. For the same alternative, first research study, label the worksheet 3-A(1)(a). For the same alternative,

When completing Section II, if you cite a study that is on the EPA website, you only need to complete questions 1, 5, and 8.

Summarize each of the research studies you cite in the Research Summary Worksheet.

If you prefer, you may provide the information requested in this worksheet in a narrative review of one or more relevant research reports. The narrative review must reply to Section I and questions 1 through 8 in Section II. A Research Summary Worksheet

### BACKGROUND

EPA must consider whether alternative pest control measures (pesticide and non-pesticidal, and their combination) could be used successfully instead of methyl bromide by crop and circumstance (geographic area.) The Agency has developed a list of possible

There are three major ways you can provide the Agency with proof of your investigative work.

- (1) Conduct and submit your own research
- (2) Cite research that has been conducted by others
- (3) Cite research listed on the EPA website

Whether you conduct the research yourself or cite studies developed by others, it is important that the studies be conducted in a scientifically sound manner. The studies should include a description of the experimental methodology used, such as applicati

The Agency has posted many research studies on a variety of crops on its website and knows of more studies currently in progress. EPA will add studies to its website as they become publicly available. You are encouraged to review the EPA website and othe

In addition, EPA acknowledges that, for certain circumstances, some alternatives are not technically feasible and therefore no research has been conducted (i.e. solarization may not be feasible in Seattle). You should look at the list of alternatives pro

Use additional pages as needed.

Alternative: Pyrethrin

Study: Alternatives to Methyl Bromide on Dried Fruits and Nuts

## Section I. Initial Screening on Technical Feasibility of Alternatives

### 1. Are there any location-specific restrictions that inhibit the use of this alternative on your site?

- 1a. Full use permitted X
- 1b. Township caps
- 1c. Alternative not acceptable in consuming country
- 1d. Other (Please describe)

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If use of this alternative is precluded by regulatory restriction for all users covered by this application, the applicant should not complete Section II.

## Worksheet 3-A. Alternatives - Technical Feasibility of Alternatives to Methyl Bromide

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### Section II. Existing Research Studies on Alternatives to Methyl Bromide

1. Is the study on EPA's website? Yes \_\_\_\_\_ No X

1a. If not on the EPA website, please attach a copy.

2. Author(s) or researcher(s) J. Larry Zettler, Research Entomologist; USDA, ARS  
San Joaquin Valley Agricultural Services Center  
Parlier, CA

3. Publication and Date of Publication Alternatives to Postharvest Uses of Methyl Bromide on Dried Fruits and Nuts to be Addressed by the CUE for Methyl Bromide

4. Location of research study Summary and bibliography of relevant research studies

5. Name of alternative(s) in study. If more than one alternative, list the ones you wish to discuss.

Pyrethrin  
\_\_\_\_\_  
\_\_\_\_\_

6. Was crop yield measured in the study? Yes NA No \_\_\_\_\_

7. Describe the effectiveness of the alternative in controlling pests in the study.

Pyrethrin is effective as a contact insecticide where pests are in free air space; it is not effective in disinfecting  
an entire bulk of a stored commodity. It does not penetrate into treated commodity and kills only when pests  
come into contact with material.  
\_\_\_\_\_  
\_\_\_\_\_

8. Discuss how the results of the study apply to your situation. Would you expect similar results? Are there other factors that would affect your adoption of this tool?

Pyrethrin is currently used to kill exposed pests that are in free air space, but other materials are required to  
disinfect commodity. MeBr does both. Use is limited because of pesticide tolerance restrictions by Japan.  
\_\_\_\_\_  
\_\_\_\_\_

## Worksheet 3-A. Alternatives - Technical Feasibility of Alternatives to Methyl Bromide

In this worksheet, you should address why an alternative pest management strategy on the list (see previous page) is or is not effective for your conditions. This worksheet contains 9 questions. You must complete one copy of worksheet 3-A for each resear

For worksheet 3-A you must complete one worksheet for each alternative, for each research study addressed. Please number the worksheets as follows. For the same alternative, first research study, label the worksheet 3-A(1)(a). For the same alternative,

When completing Section II, if you cite a study that is on the EPA website, you only need to complete questions 1, 5, and 8.

Summarize each of the research studies you cite in the Research Summary Worksheet.

If you prefer, you may provide the information requested in this worksheet in a narrative review of one or more relevant research reports. The narrative review must reply to Section I and questions 1 through 8 in Section II. A Research Summary Worksheet

### BACKGROUND

EPA must consider whether alternative pest control measures (pesticide and non-pesticidal, and their combination) could be used successfully instead of methyl bromide by crop and circumstance (geographic area.) The Agency has developed a list of possible

There are three major ways you can provide the Agency with proof of your investigative work.

- (1) Conduct and submit your own research
- (2) Cite research that has been conducted by others
- (3) Cite research listed on the EPA website

Whether you conduct the research yourself or cite studies developed by others, it is important that the studies be conducted in a scientifically sound manner. The studies should include a description of the experimental methodology used, such as applicati

The Agency has posted many research studies on a variety of crops on its website and knows of more studies currently in progress. EPA will add studies to its website as they become publicly available. You are encouraged to review the EPA website and othe

In addition, EPA acknowledges that, for certain circumstances, some alternatives are not technically feasible and therefore no research has been conducted (i.e. solarization may not be feasible in Seattle). You should look at the list of alternatives pro

Use additional pages as needed.

Alternative: Biological Agents

Study: Alternatives to Methyl Bromide on Dried Fruits and Nuts

## Section I. Initial Screening on Technical Feasibility of Alternatives

### 1. Are there any location-specific restrictions that inhibit the use of this alternative on your site?

- 1a. Full use permitted X
- 1b. Township caps
- 1c. Alternative not acceptable in consuming country
- 1d. Other (Please describe)

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If use of this alternative is precluded by regulatory restriction for all users covered by this application, the applicant should not complete Section II.

## Worksheet 3-A. Alternatives - Technical Feasibility of Alternatives to Methyl Bromide

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### Section II. Existing Research Studies on Alternatives to Methyl Bromide

1. Is the study on EPA's website? Yes \_\_\_\_\_ No X

1a. If not on the EPA website, please attach a copy.

2. Author(s) or researcher(s) J. Larry Zettler, Research Entomologist; USDA, ARS  
San Joaquin Valley Agricultural Services Center  
Parlier, CA

3. Publication and Date of Publication Alternatives to Postharvest Uses of Methyl Bromide on Dried Fruits and Nuts to be Addressed by the CUE for Methyl Bromide

4. Location of research study Summary and bibliography of relevant research studies

5. Name of alternative(s) in study. If more than one alternative, list the ones you wish to discuss.

Granulosis virus  
\_\_\_\_\_  
\_\_\_\_\_

6. Was crop yield measured in the study? Yes NA No \_\_\_\_\_

7. Describe the effectiveness of the alternative in controlling pests in the study.

A granulosis virus is registered for the control of Indianmeal moth. It is very effective only against Indianmeal  
moth larvae and is registered for use as a protectant in breeding grounds (e.g., cracks and crevices).  
\_\_\_\_\_  
\_\_\_\_\_

8. Discuss how the results of the study apply to your situation. Would you expect similar results? Are there other factors that would affect your adoption of this tool?

Host and developmental stage specificity limits use and value. Other materials are required for control of other  
life stages of Indianmeal moth, other pests and deinfestations.  
\_\_\_\_\_  
\_\_\_\_\_

## Worksheet 3-A. Alternatives - Technical Feasibility of Alternatives to Methyl Bromide

In this worksheet, you should address why an alternative pest management strategy on the list (see previous page) is or is not effective for your conditions. This worksheet contains 9 questions. You must complete one copy of worksheet 3-A for each resear

For worksheet 3-A you must complete one worksheet for each alternative, for each research study addressed. Please number the worksheets as follows. For the same alternative, first research study, label the worksheet 3-A(1)(a). For the same alternative,

When completing Section II, if you cite a study that is on the EPA website, you only need to complete questions 1, 5, and 8.

Summarize each of the research studies you cite in the Research Summary Worksheet.

If you prefer, you may provide the information requested in this worksheet in a narrative review of one or more relevant research reports. The narrative review must reply to Section I and questions 1 through 8 in Section II. A Research Summary Worksheet

### BACKGROUND

EPA must consider whether alternative pest control measures (pesticide and non-pesticidal, and their combination) could be used successfully instead of methyl bromide by crop and circumstance (geographic area.) The Agency has developed a list of possible

There are three major ways you can provide the Agency with proof of your investigative work.

- (1) Conduct and submit your own research
- (2) Cite research that has been conducted by others
- (3) Cite research listed on the EPA website

Whether you conduct the research yourself or cite studies developed by others, it is important that the studies be conducted in a scientifically sound manner. The studies should include a description of the experimental methodology used, such as applicati

The Agency has posted many research studies on a variety of crops on its website and knows of more studies currently in progress. EPA will add studies to its website as they become publicly available. You are encouraged to review the EPA website and othe

In addition, EPA acknowledges that, for certain circumstances, some alternatives are not technically feasible and therefore no research has been conducted (i.e. solarization may not be feasible in Seattle). You should look at the list of alternatives pro

Use additional pages as needed.

Alternative: Cold Treatment

Study: Alternatives to Methyl Bromide on Dried Fruits and Nuts

## Section I. Initial Screening on Technical Feasibility of Alternatives

### 1. Are there any location-specific restrictions that inhibit the use of this alternative on your site?

- 1a. Full use permitted \_\_\_\_\_
- 1b. Township caps \_\_\_\_\_
- 1c. Alternative not acceptable in consuming country \_\_\_\_\_
- 1d. Other (Please describe) \_\_\_\_\_

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If use of this alternative is precluded by regulatory restriction for all users covered by this application, the applicant should not complete Section II.



## Worksheet 3-A. Alternatives - Technical Feasibility of Alternatives to Methyl Bromide

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### Section II. Existing Research Studies on Alternatives to Methyl Bromide

1. Is the study on EPA's website? Yes \_\_\_\_\_ No X

1a. If not on the EPA website, please attach a copy.

2. Author(s) or researcher(s) J. Larry Zettler, Research Entomologist; USDA, ARS  
San Joaquin Valley Agricultural Services Center  
Parlier, CA

3. Publication and Date of Publication Alternatives to Postharvest Uses of Methyl Bromide on Dried Fruits and Nuts to be Addressed by the CUE for Methyl Bromide

4. Location of research study Summary and bibliography of relevant research studies

5. Name of alternative(s) in study. If more than one alternative, list the ones you wish to discuss.

Cold Treatment  
\_\_\_\_\_  
\_\_\_\_\_

6. Was crop yield measured in the study? Yes NA No \_\_\_\_\_

7. Describe the effectiveness of the alternative in controlling pests in the study.

Insect feeding damage can be reduced, but complete disinfestation may require very low temperatures or  
prolonged exposure. It requires major changes in handling methods and extensive retrofitting of existing facilities.  
Cold treatment is not practical for disinfesting large volumes or for high throughput.  
\_\_\_\_\_  
\_\_\_\_\_

8. Discuss how the results of the study apply to your situation. Would you expect similar results? Are there other factors that would affect your adoption of this tool?

Not a proven technology for commercial operations. Not economically practical.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Worksheet 3-A. Alternatives - Technical Feasibility of Alternatives to Methyl Bromide

In this worksheet, you should address why an alternative pest management strategy on the list (see previous page) is or is not effective for your conditions. This worksheet contains 9 questions. You must complete one copy of worksheet 3-A for each resear

For worksheet 3-A you must complete one worksheet for each alternative, for each research study addressed. Please number the worksheets as follows. For the same alternative, first research study, label the worksheet 3-A(1)(a). For the same alternative,

When completing Section II, if you cite a study that is on the EPA website, you only need to complete questions 1, 5, and 8.

Summarize each of the research studies you cite in the Research Summary Worksheet.

If you prefer, you may provide the information requested in this worksheet in a narrative review of one or more relevant research reports. The narrative review must reply to Section I and questions 1 through 8 in Section II. A Research Summary Worksheet

### BACKGROUND

EPA must consider whether alternative pest control measures (pesticide and non-pesticidal, and their combination) could be used successfully instead of methyl bromide by crop and circumstance (geographic area.) The Agency has developed a list of possible

There are three major ways you can provide the Agency with proof of your investigative work.

- (1) Conduct and submit your own research
- (2) Cite research that has been conducted by others
- (3) Cite research listed on the EPA website

Whether you conduct the research yourself or cite studies developed by others, it is important that the studies be conducted in a scientifically sound manner. The studies should include a description of the experimental methodology used, such as applicati

The Agency has posted many research studies on a variety of crops on its website and knows of more studies currently in progress. EPA will add studies to its website as they become publicly available. You are encouraged to review the EPA website and othe

In addition, EPA acknowledges that, for certain circumstances, some alternatives are not technically feasible and therefore no research has been conducted (i.e. solarization may not be feasible in Seattle). You should look at the list of alternatives pro

Use additional pages as needed.

Alternative: IPM

Study: Alternatives to Methyl Bromide on Dried Fruits and Nuts

## Section I. Initial Screening on Technical Feasibility of Alternatives

### 1. Are there any location-specific restrictions that inhibit the use of this alternative on your site?

- 1a. Full use permitted \_\_\_\_\_
- 1b. Township caps \_\_\_\_\_
- 1c. Alternative not acceptable in consuming country \_\_\_\_\_
- 1d. Other (Please describe) \_\_\_\_\_

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If use of this alternative is precluded by regulatory restriction for all users covered by this application, the applicant should not complete Section II.

## Worksheet 3-A. Alternatives - Technical Feasibility of Alternatives to Methyl Bromide

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### Section II. Existing Research Studies on Alternatives to Methyl Bromide

1. Is the study on EPA's website? Yes \_\_\_\_\_ No   X  

1a. If not on the EPA website, please attach a copy.

2. Author(s) or researcher(s) J. Larry Zettler, Research Entomologist; USDA, ARS  
San Joaquin Valley Agricultural Services Center  
Parlier, CA

3. Publication and Date of Publication Alternatives to Postharvest Uses of Methyl Bromide on Dried Fruits and Nuts to be Addressed by the CUE for Methyl Bromide

4. Location of research study Summary and bibliography of relevant research studies

5. Name of alternative(s) in study. If more than one alternative, list the ones you wish to discuss.

IPM  
\_\_\_\_\_  
\_\_\_\_\_

6. Was crop yield measured in the study? Yes   X   No \_\_\_\_\_

7. Describe the effectiveness of the alternative in controlling pests in the study.

Low oxygen controlled atmosphere (CA) followed by cold storage, CA or an application of granulosis virus has  
demonstrated control in research scale efforts.  
\_\_\_\_\_  
\_\_\_\_\_

8. Discuss how the results of the study apply to your situation. Would you expect similar results? Are there other factors that would affect your adoption of this tool?

CA and cold storage expenditures are cost prohibitive. This is not practical on a commercial scale.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Worksheet 3-A. Alternatives - Technical Feasibility of Alternatives to Methyl Bromide

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If you prefer, you may provide the information requested in this worksheet in a narrative review of one or more relevant research reports. The narrative review must reply to Section I and questions 1 through 8 in Section II. A Research Summary Worksheet

### BACKGROUND

EPA must consider whether alternative pest control measures (pesticide and non-pesticidal, and their combination) could be used successfully instead of methyl bromide by crop and circumstance (geographic area.) The Agency has developed a list of possible

There are three major ways you can provide the Agency with proof of your investigative work.

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The Agency has posted many research studies on a variety of crops on its website and knows of more studies currently in progress. EPA will add studies to its website as they become publicly available. You are encouraged to review the EPA website and othe

In addition, EPA acknowledges that, for certain circumstances, some alternatives are not technically feasible and therefore no research has been conducted (i.e. solarization may not be feasible in Seattle). You should look at the list of alternatives pro

Use additional pages as needed.

Alternative: Heat Treatment

Study: Alternatives to Methyl Bromide on Dried Fruits and Nuts

## Section I. Initial Screening on Technical Feasibility of Alternatives

### 1. Are there any location-specific restrictions that inhibit the use of this alternative on your site?

- 1a. Full use permitted \_\_\_\_\_
- 1b. Township caps \_\_\_\_\_
- 1c. Alternative not acceptable in consuming country \_\_\_\_\_
- 1d. Other (Please describe) \_\_\_\_\_

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## Worksheet 3-A. Alternatives - Technical Feasibility of Alternatives to Methyl Bromide

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### Section II. Existing Research Studies on Alternatives to Methyl Bromide

1. Is the study on EPA's website? Yes \_\_\_\_\_ No X

1a. If not on the EPA website, please attach a copy.

2. Author(s) or researcher(s) J. Larry Zettler, Research Entomologist; USDA, ARS  
San Joaquin Valley Agricultural Services Center  
Parlier, CA

3. Publication and Date of Publication Alternatives to Postharvest Uses of Methyl Bromide on Dried Fruits and Nuts to be Addressed by the CUE for Methyl Bromide

4. Location of research study Summary and bibliography of relevant research studies

5. Name of alternative(s) in study. If more than one alternative, list the ones you wish to discuss.

Heat treatment

6. Was crop yield measured in the study? Yes X No \_\_\_\_\_

7. Describe the effectiveness of the alternative in controlling pests in the study.

Brief exposures to high temperatures can eliminate insects without adversely affecting quality.

8. Discuss how the results of the study apply to your situation. Would you expect similar results? Are there other factors that would affect your adoption of this tool?

Heat treatment is not a proven commercial practice. It would require extensive retrofitting of current facilities and probably can not handle high volumes of the commodity.

## Worksheet 3-A. Alternatives - Technical Feasibility of Alternatives to Methyl Bromide

In this worksheet, you should address why an alternative pest management strategy on the list (see previous page) is or is not effective for your conditions. This worksheet contains 9 questions. You must complete one copy of worksheet 3-A for each resear

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Summarize each of the research studies you cite in the Research Summary Worksheet.

If you prefer, you may provide the information requested in this worksheet in a narrative review of one or more relevant research reports. The narrative review must reply to Section I and questions 1 through 8 in Section II. A Research Summary Worksheet

### BACKGROUND

EPA must consider whether alternative pest control measures (pesticide and non-pesticidal, and their combination) could be used successfully instead of methyl bromide by crop and circumstance (geographic area.) The Agency has developed a list of possible

There are three major ways you can provide the Agency with proof of your investigative work.

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The Agency has posted many research studies on a variety of crops on its website and knows of more studies currently in progress. EPA will add studies to its website as they become publicly available. You are encouraged to review the EPA website and othe

In addition, EPA acknowledges that, for certain circumstances, some alternatives are not technically feasible and therefore no research has been conducted (i.e. solarization may not be feasible in Seattle). You should look at the list of alternatives pro

Use additional pages as needed.

Alternative: Irradiation

Study: Alternatives to Methyl Bromide on Dried Fruits and Nuts

## Section I. Initial Screening on Technical Feasibility of Alternatives

### 1. Are there any location-specific restrictions that inhibit the use of this alternative on your site?

- 1a. Full use permitted \_\_\_\_\_
- 1b. Township caps \_\_\_\_\_
- 1c. Alternative not acceptable in consuming country \_\_\_\_\_
- 1d. Other (Please describe) \_\_\_\_\_

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If use of this alternative is precluded by regulatory restriction for all users covered by this application, the applicant should not complete Section II.

## Worksheet 3-A. Alternatives - Technical Feasibility of Alternatives to Methyl Bromide

### Section II. Existing Research Studies on Alternatives to Methyl Bromide

1. Is the study on EPA's website? Yes \_\_\_\_\_ No X

1a. If not on the EPA website, please attach a copy.

2. Author(s) or researcher(s) J. Larry Zettler, Research Entomologist; USDA, ARS  
San Joaquin Valley Agricultural Services Center  
Parlier, CA

3. Publication and Date of Publication Alternatives to Postharvest Uses of Methyl Bromide on Dried Fruits and Nuts to be Addressed by the CUE for Methyl Bromide

4. Location of research study Summary and bibliography of relevant research studies

5. Name of alternative(s) in study. If more than one alternative, list the ones you wish to discuss.

Irradiation

6. Was crop yield measured in the study? Yes NA No \_\_\_\_\_

7. Describe the effectiveness of the alternative in controlling pests in the study.

Irradiation rapidly and effectively stops feeding with no product residues, but leaves living (nonfeeding) insects  
in commodity. This is not acceptable to the consumer.

8. Discuss how the results of the study apply to your situation. Would you expect similar results? Are there other factors that would affect your adoption of this tool?

Irradiation is not a proven commercial alternative. Although feeding damage is controlled, live insects remain in  
the commodity.

## Worksheet 3-A. Alternatives - Technical Feasibility of Alternatives to Methyl Bromide

In this worksheet, you should address why an alternative pest management strategy on the list (see previous page) is or is not effective for your conditions. This worksheet contains 9 questions. You must complete one copy of worksheet 3-A for each resear

For worksheet 3-A you must complete one worksheet for each alternative, for each research study addressed. Please number the worksheets as follows. For the same alternative, first research study, label the worksheet 3-A(1)(a). For the same alternative,

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Summarize each of the research studies you cite in the Research Summary Worksheet.

If you prefer, you may provide the information requested in this worksheet in a narrative review of one or more relevant research reports. The narrative review must reply to Section I and questions 1 through 8 in Section II. A Research Summary Worksheet

### BACKGROUND

EPA must consider whether alternative pest control measures (pesticide and non-pesticidal, and their combination) could be used successfully instead of methyl bromide by crop and circumstance (geographic area.) The Agency has developed a list of possible

There are three major ways you can provide the Agency with proof of your investigative work.

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- (3) Cite research listed on the EPA website

Whether you conduct the research yourself or cite studies developed by others, it is important that the studies be conducted in a scientifically sound manner. The studies should include a description of the experimental methodology used, such as applicati

The Agency has posted many research studies on a variety of crops on its website and knows of more studies currently in progress. EPA will add studies to its website as they become publicly available. You are encouraged to review the EPA website and othe

In addition, EPA acknowledges that, for certain circumstances, some alternatives are not technically feasible and therefore no research has been conducted (i.e. solarization may not be feasible in Seattle). You should look at the list of alternatives pro

Use additional pages as needed.

Alternative: Pest Resistant Packaging

Study: Alternatives to Methyl Bromide on Dried Fruits and Nuts

## Section I. Initial Screening on Technical Feasibility of Alternatives

### 1. Are there any location-specific restrictions that inhibit the use of this alternative on your site?

- 1a. Full use permitted X
- 1b. Township caps
- 1c. Alternative not acceptable in consuming country
- 1d. Other (Please describe)

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If use of this alternative is precluded by regulatory restriction for all users covered by this application, the applicant should not complete Section II.



## Worksheet 3-A. Alternatives - Technical Feasibility of Alternatives to Methyl Bromide

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### Section II. Existing Research Studies on Alternatives to Methyl Bromide

1. Is the study on EPA's website? Yes \_\_\_\_\_ No X

1a. If not on the EPA website, please attach a copy.

2. Author(s) or researcher(s) J. Larry Zettler, Research Entomologist; USDA, ARS  
San Joaquin Valley Agricultural Services Center  
Parlier, CA

3. Publication and Date of Publication Alternatives to Postharvest Uses of Methyl Bromide on Dried Fruits and Nuts to be Addressed by the CUE for Methyl Bromide

4. Location of research study Summary and bibliography of relevant research studies

5. Name of alternative(s) in study. If more than one alternative, list the ones you wish to discuss.

Pest resistant packaging.  
\_\_\_\_\_  
\_\_\_\_\_

6. Was crop yield measured in the study? Yes NA No \_\_\_\_\_

7. Describe the effectiveness of the alternative in controlling pests in the study.

Pest resistant packaging effectively prevents reinfestation of the finished product, but can not be used for  
disinfestation and can not prevent reinfestation of stored bulk product.  
\_\_\_\_\_  
\_\_\_\_\_

8. Discuss how the results of the study apply to your situation. Would you expect similar results? Are there other factors that would affect your adoption of this tool?

Does not address control during bulk storage in warehouse conditions.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Phosphine

<b>Col. A: Name of Product and Non-chemical Control</b>	<p>Enter all alternatives and non-chemical pest control that would replace one treatment of methyl bromide throughout the fumigation cycle. See the Fumigation Cycle Worksheet for a comprehensive definition of the fumigation cycle. If multiple crops are grown during the interval between fumigations (e.g. tomatoes followed by peppers in a single growing season, or strawberries followed by lettuce over 2 or 3 years) include all of the pesticides that replace methyl bromide for the entire interval. Do not include pesticides that are used along with methyl bromide--enter only the additional pest control if methyl bromide were not available.</p> <p>If someone other than the applicant previously benefited from the application of methyl bromide in the fumigation cycle and you do not have the quantitative data for the crops grown on the same land, please indicate so in the comments section below.</p>
<b>Col. B: Target Pests</b>	Be as specific as possible regarding the species or classes of pests controlled by the active ingredient or pesticide product.
<b>Col. C: Active Ingredients</b>	Use one row for each active ingredient (ai). For example, if a product contains 2 ai's use 2 rows for that product. Once a row is completed for a given product, then only Col. B (if applicable), C, and E need to be completed for additional rows regarding the same product.
<b>Col. D: Formulation</b>	Enter the formulation or the % of active ingredient.
<b>Col. E, F, G: Application Rate</b>	As a cross check, EPA is requesting both the amount of active ingredient in Col. E and product applied per area in Col. F. Indicate the unit of the product in Col. G.
<b>Col. H, I, J: Prices and Costs</b>	<b>Use 2001 prices and costs.</b> If the product is custom applied you may enter the total cost in the last column (Col. M) and override the formula. If a pesticide is applied by the user, enter the price of the product in Col. H and the cost of applying it in Col. I. Enter any other costs associated with <b>applying</b> this product in Col. J, specifying what they are in the comments section at the bottom of this sheet.
<b>Col. K: Area Treated</b>	Enter the area receiving at least one application of the pesticide.
<b>Col. L: # of Applications per Year</b>	Enter the number of applications in a fumigation cycle comparable to methyl bromide for this alternative pest control regimen. Since this number is an average, it does not need to be a whole number.
<b>Col. M: Cost per Area in 2001 Dollars</b>	Enter the cost per area in 2001 dollars. Col. M will be calculated automatically using the data you have entered for a chemical pest control, or, the formula in Col. M can be overridden if the cost per area is known because the product was custom applied.
<b>Non-chemical Control</b>	Enter data near the bottom of the form. Identify the control in Col. A. Enter the target pests in Col. B. Describe the non-chemical pest control Col. B-L. Enter the costs in Col. M in 2001 dollars.

[illegible]

Non-Chemical Pest Control	Target Pests	Description	Cost/area
			<b>Total</b> \$ 9,068.43
<b>Comments:</b> If you do not have the quantitative data for additional crops grown on the same land, please indicate so in the comment section.			

**Not Available**

The purpose of this worksheet is to identify the gross revenue for units (crop, commodity, structure) when using an alternative compared to gross revenue when using methyl bromide. Post-harvest and structural users may modify this form to accommodate differences in operations when providing gross revenue data.

<b>Col. A: Crop/Commodity</b>	Enter all crops/commodities that can be grown/treated during the same interval of time comprising a methyl bromide fumigation cycle. Please discuss changes in crop cycles resulting from alternative use in the comments. See the Fumigation Cycle Worksheet for a comprehensive definition of the fumigation cycle.  If someone other than the applicant benefits from the application of methyl bromide in the fumigation cycle and you do not have the quantitative data for the crops grown on the same land, please indicate so in the comments section below.				
<b>Col. B: Price Factors</b>	Enter in Col. B any factors that determine prices (e.g., grade, time, market). If you received different prices for your crop/commodity as a result of quality, grade, market (e.g., fresh or processing), timing of harvest, etc., you may itemize by using more than one row. Itemize or aggregate these factors to the extent appropriate in making the case that the use of alternatives affects these price factors.				
<b>Col. C: Unit of Crop/Commodity</b>	Enter the unit of measurement for your crop/commodity.				
<b>Col. D: Crop/Commodity Yield</b>	Enter the number of units of crop/commodity produced per area for that price factor identified.				
<b>Col. E: Price</b>	Enter the average 2001 prices received by the users for that crop/commodity and price factor.				
<b>Col. F: Gross Revenue</b>	In the electronic version, revenue is automatically calculated below using the data you entered for yield and price. If revenue is not equal to yield times price, you may override the formula and enter a different revenue amount. Please explain why this revenue amount is different in the comment section				
<b>Area is defined below</b> as follows for each user: acres for growers, cubic feet for post-harvest operations, and square feet for structural applications.					
A	B	C	D	E	F
<b>Crop/Commodity</b>	<b>Price Factors</b> (grade, time, market)	<b>Unit of Crop/Commodity</b> (e.g., pounds, bushels)	<b>Crop/Commodity Yield</b> (Units per area)	<b>Price</b> (per unit of crop/commodity)	<b>Revenue</b> (per area)
See comments					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
					\$ 0.00
				<b>Total Revenue</b>	\$ 0.00
<b>Comments:</b> No data available. It is known that over time, loss will increase due to insect resistance to phosphine					

**Worksheet 3-D. Alternatives - Changes in Other Costs for Alternative:****Not Available**

If a consortium is submitting this application, the data for this table should reflect a <i>representative user</i> .					
Enter data only for costs (other than the cost of alternative pest control) that change as a result of using the alternatives instead of methyl bromide. Enter the whole cost, not just the incremental changes. Enter the cost in Col. B for custom operation costs, <b>or</b> in Col. C and D for operations done by user.					
<b>Col. A: Operation or Cost Item</b>	Identify the operations or cost items that change as a result of not using methyl bromide.				
<b>Col. B: Custom Operation Cost</b>	Enter custom operation costs that change in Col. B.				
<b>Col. C, D, E: Costs per Area</b>	Enter in Col. C and D, material and labor costs per area that change for operations done by user. The total cost per area is calculated automatically from the values you enter in Cols. C and D.				
<b>Col. F: Typical Equipment Used</b>	Identify changes in the typical equipment used by the user as a result of not using methyl bromide. Please be specific such as tractor horsepower. No cost data are required in this column.				
<b>Area is defined below</b> as follows for each user: acres for growers, cubic feet for post-harvest operations, and square feet for structural applications.					
A	B	C	D	E	F
Operation or Cost Item	Custom Operation Cost per Area	Operation Done by User			Typical Equipment Used
		Material Cost per Area	Labor Cost per Area	Total Cost per Area	
				\$ 0.00	
				\$ 0.00	
				\$ 0.00	
				\$ 0.00	
				\$ 0.00	
				\$ 0.00	
				\$ 0.00	
				\$ 0.00	
				\$ 0.00	
				\$ 0.00	
				\$ 0.00	
				\$ 0.00	
				\$ 0.00	
				\$ 0.00	
<b>Total Custom per Area</b>	\$ 0.00	<b>User Total per area</b>		\$ 0.00	
<b>Comments:</b>		Data not available. It is known that more fumigation chambers would have to be constructed because current warehouses have too much equipment that would corrode when exposed to phosphine. Increased exposure time (5-7 days vs. 12-24 for MeBr) and additional movement of fruit would increase operational costs. This is not a problem with raisins that are stacked and tarped (not stored in warehouses).			

## Worksheet 4. Alternatives - Future Research Plans

Please describe future plans to test alternatives to methyl bromide. (All available methyl bromide alternatives from the alternatives list should have been tested or have future tests planned.) There is no need to complete a separate worksheet for future research plans for each alternative - you may use this worksheet to describe all future research plans.

1. Name of study: Unknown at this time (see below).

2. Researcher(s): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. Your test is planned for: \_\_\_\_\_

4. Location: \_\_\_\_\_

5. Name of alternative to be tested:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6. Will crop yield be measured in the study? Yes \_\_\_\_\_ No \_\_\_\_\_

7. If additional testing is not planned, please explain why. (For example, the available alternatives have been tested and found unsuitable, an alternative has been identified but is not yet registered for this crop, available alternatives are too expensive for this crop, etc.)

Additional research will continue, but studies and researchers have not been defined at this time. Research  
planning typically occurs in fall and winter months.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Worksheet 5. Additional Information

### 1. How will you minimize your use and/or emissions of methyl bromide?

- 1a. Check all methods you will use ☐ Nothing  
☒ Tarpaulin (high density polyethylene)  
☐ Virtually impermeable film (VIF)  
☐ Cultural practices (please specify) \_\_\_\_\_  
\_\_\_\_\_

1b. Will you use other pesticides to reduce use of methyl bromide? Yes ☒ No ☐

If yes please specify. Phosphine is currently in use; fig and prune have reduced use of MeBr as much as possible.

1c. Other non-chemical methods: (please specify):  
\_\_\_\_\_  
\_\_\_\_\_

### 2. Do you have access to recycled methyl bromide?

Yes ☐ No ☒

If yes, how many pounds? \_\_\_\_\_ lbs.

### 3. Do you anticipate that you will have any methyl bromide in storage on January 1, 2005?

Yes ☐ No ☒

If yes, how many pounds? \_\_\_\_\_ lbs.

### 4. What is the cumulative amount spent to date by the user or consortium on research to develop alternatives to methyl bromide (beginning in 1992)?

\$ > 1,000,000

### 5. Other investments, if any, made to reduce your reliance on methyl bromide. Describe each investment and its associated cost.

\_\_\_\_\_  
\_\_\_\_\_

### 6. Identify what factors would allow you to stop or reduce your use of methyl bromide (e.g. registration of particular pesticide; completion of research plan; capital outlay).

Sulfuryl fluoride registration may impact MeBr use. Use on commercial scale and economics unknown at this time.

When do you expect these to occur?

2002/2003

### 7. Range of acres farmed by growers included in this application?

(insert number of users in each category)

NA 0-10 acres  
\_\_\_\_\_ 10-25 acres  
\_\_\_\_\_ 25-50 acres  
\_\_\_\_\_ 50-100 acres  
\_\_\_\_\_ 100-200 acres  
\_\_\_\_\_ 200-400 acres  
\_\_\_\_\_ over 400 acres

## Worksheet 5. Additional Information (continued)

**8. Range of square feet of the area to which applicants included in this application will apply methyl bromide?** (insert number of users in each category)

- \_\_\_\_ 0 - 5,000 sq. ft.  
\_\_\_\_ 5,001 - 10,000 sq. ft.  
\_\_\_\_ 10,001 - 20,000 sq. ft.  
\_\_\_\_ 20,001 - 40,000 sq. ft.  
\_\_\_\_ 40,001 - 80,000 sq. ft.  
\_\_\_\_ 80,001 - 160,000 sq. ft.  
\_\_\_\_ over 160,000 sq. ft.

I certify that all information contained in this document is factual to the best of my knowledge.

**Signature** \_\_\_\_\_

**Date** \_\_\_\_\_

**Print Name** \_\_\_\_\_

**Title** \_\_\_\_\_

Information in this application may be aggregated with information from other applications and used by the United States government to justify claims in the national nomination package that a particular use of methyl bromide be considered "critical" and authorized for an exemption beyond the 2005 phaseout. Use of aggregate data will be crucial to making compelling arguments in favor of critical use exemptions. **By signing below**, you agree not to assert any claim of confidentiality that would affect the disclosure by EPA of aggregate information based in part on information contained in this application.

**Signature** \_\_\_\_\_

**Date** \_\_\_\_\_

**Print Name** \_\_\_\_\_

**Title** \_\_\_\_\_

Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information. Public reporting burden for this collection of information is estimated to average 324 hours per response and assumes a large portion of applications will be submitted by consortia on behalf of many individual users of methyl bromide. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a current OMB control number.



## Worksheet 6. Application Summary

This worksheet will be posted on the web to notify the public of requests for critical use exemptions beyond the 2005 phase out for methyl bromide. Therefore, this worksheet cannot be claimed as CBI.

1. Name of Applicant: California Dried Plum Board

2. Location: Fresno, CA

3. Crop: Prunes (Dried Plums)

4. Pounds of Methyl Bromide Requested 2005 45,000

5. Area Treated with Methyl Bromide 2005 30,000,000 cubic feet units

6. If methyl bromide is requested for additional years, reason for request:

Most alternatives have not been proven feasible or economical on a commercial scale. Currently registered products are being used as much as commercial operations allow.

2006 45,000 lbs. Area Treated 30,000,000 cubic feet units

2007 45,000 lbs. Area Treated 30,000,000 cubic feet units

Place an "X" in the column(s) labeled "Not Technically Feasible" and/or "Not Economically Feasible" where appropriate. Use the "Reasons" column to describe why the potential alternative is not feasible.

Potential Alternatives	Not Technically Feasible	Not Economically Feasible	Reasons
Phosphine		x	Very corrosive, resulting in higher equipment maintenance costs; would require constructing new facilities. Insect resistance is a concern. Currently used as part of control program.
CO <sub>2</sub>		X	Costly to implement and not feasible on a commercial scale.
Contact Insecticides	X		Can not obtain sufficient coverage on bulk commodity; leaves chemical residues. Does not control internal infestations.
Pyrethrins	X		Controls only insects in free air space. Not effective in disinfesting bulk commodity. Currently used as part of control program.
Biological agents (granulosis virus)	X		Controls only larval stage of Indianmeal moth. Will not kill other insect pests and will not disinfest commodity.
Cold Treatment	X	X	Not practical for disinfesting large, commercial volumes of commodity. Would require very expensive retrofitting of existing facilities.
IPM	X	X	Has not been proven commercially. Expenditures for facilities would be cost prohibitive.
Heat Treatment	X	X	Not practical for disinfesting large, commercial volumes of commodity. Would require very expensive retrofitting of existing facilities.
Irradiation	X	X	Not proven as a commercial alternative. Living insects remain in commodity, which is unacceptable to consumers.
Pest Resistant Packaging	X		Only prevents reinfestation of finished product. It does not address disinfesting stored bulk product.